SEQUENCE LISTING

<110>   E.I. du Pont deNemours and Co., Inc.
        Cheng, Qiong
        Tao, Luan
        Sedkova, Natalia

<120>   GENES ENCODING CAROTENOID COMPOUNDS

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<150>   US 60/477,874
<151>   2003-06-12

<150>   US 60/527,083
<151>   2003-12-03

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<170>   PatentIn version 3.2

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Gly Asp Glu Arg Asp Arg Val Ser Ser Ala Met Arg Glu Gly Val Leu
        35   40   45

Ala Pro Gly Lys Arg Ile Arg Pro Leu Leu Leu Ile Leu Ala Ala Arg
    50   55   60

Asp Leu Gly Cys Asp Arg Asp His Pro Gly Leu Leu Asp Met Ala Cys
65   70   75   80

Ala Val Glu Met Val His Ala Ser Ser Leu Ile Leu Asp Asp Ile Pro
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Cys Met Asp Asn Ala Ala Leu Arg Arg Gly Arg Pro Thr Ile His Arg
            100   105   110

Gln Tyr Gly Glu Asp Val Ala Ile Leu Ala Ala Val Ala Leu Leu Ser
        115   120   125

Ser Ala Phe Gly Val Met Val Ala Ala Gln Gly Leu Ser Pro Glu Cys
    130   135   140

Arg Ser Gln Ala Val Ala Glu Leu Ser Met Ala Val Gly Thr Gln Gly
145   150   155   160

Leu Val Gln Gly Gln Tyr Lys Asp Leu Arg Glu Gly Thr Ala Pro Arg
            165   170   175

Ser Ala Glu Glu Ile Ala Thr Thr Asn Glu Leu Lys Thr Ser Val Leu
            180   185   190

Phe Gly Ala Thr Leu Gln Ile Ala Ala Leu Ala Ala Gly Ala Ser Pro
        195   200   205

Ala Ala Arg Gln Lys Met Arg Cys Phe Ala Gln Asp Leu Gly Gln Ala
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Phe Gln Leu Leu Asp Asp Leu Ala Asp Gly His Ala Gly Thr Gly Lys
225   230   235   240

Asp Ile Asn Lys Asp Ala Gly Lys Ser Thr Leu Val Ala Met Leu Gly
            245   250   255

Ser Asp Ala Val Arg Glu Arg Leu Asp Thr His Leu Arg Arg Ala Asp
            260   265   270

Ala His Phe Ser Arg Ala Cys Gly Lys Asn Gln Ala Thr Arg Arg Phe

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<213> Pantoea agglomerans strain DC404

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            20   25   30

Ala Trp Arg Phe Glu His Cys Ala Leu Pro Glu Leu Asp Leu Asp Gly
        35   40   45

Page 3

Ile Asp Leu Ser Thr Thr Leu Phe Ser Arg Pro Leu Lys Ala Pro Val
    50   55   60

Leu Ile Ser Ser Met Thr Gly Gly Ala Ala Arg Ala Arg Asp Ile Asn
65   70   75   80

Arg His Leu Ala Gln Ala Ala Gln Thr Leu Gly Leu Ala Met Gly Val
            85   90   95

Gly Ser Gln Arg Val Ala Leu Glu Asp Gly Ala Gln His Gly Leu Asp
            100   105   110

Ala Gln Leu Arg His Ile Ala Pro Asp Val Pro Leu Leu Ala Asn Leu
        115   120   125

Gly Ala Ala Gln Ile Arg Gly Ala Gln Gly Leu Asp Tyr Ala Arg Arg
    130   135   140

Ala Val Asp Met Ile Asp Ala Asp Ala Leu Ile Val His Leu Asn Pro
145   150   155   160

Leu Gln Glu Ala Leu Gln Gly Gly Gly Asp Arg Asp Trp Arg Gly Ile
            165   170   175

Leu Asn Ala Ile Ala Gln Leu Val Arg Asp Leu Pro Val Pro Val Val
            180   185   190

Val Lys Glu Val Gly Ala Gly Ile Ser Pro Asp Val Ala Cys Arg Leu
            195   200   205

Ala Asp Val Gly Val Ala Met Ile Asp Ile Ala Gly Ala Gly Gly Thr
    210   215   220

Ser Trp Ala Ala Val Glu Ala Glu Arg Ala Pro Thr Pro Glu Ala Arg
225   230   235   240

Asn Val Ala Met Ala Phe Ala Asp Trp Gly Ile Pro Thr Ala Asp Ala
                245   250   255

Leu Arg Arg Val His Leu Ala Leu Pro Asp Ile Pro Leu Ile Ala Ser
            260   265   270

Gly Gly Ile Ala Asn Gly Ile Asp Ala Ala Lys Ala Ile Ala Leu Gly
        275   280   285

Ala Asp Leu Val Gly Gln Ala Ala Ala Val Leu Ala His Ala Asn Ala
    290   295   300

Ser Gly Asp Ala Ala Ile Ala His Phe Arg Thr Leu Ile Thr Gln Leu
305   310   315   320

Arg Ile Ala Cys Phe Cys Thr Gly Ser Ala Asn Leu Gln Ala Leu Arg
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His Ala Thr Leu Leu Pro Val Asn Gly Gly Ala Ser Leu
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Met Leu Glu Cys Gly Asp Ala Pro Gly Gly Asn His Thr Trp Ser Phe
        35   40   45

His Gln His Asp Ile Thr Pro Ala Gln His Ala Trp Leu Ala Pro Leu
        50   55   60

Val Ala His Arg Trp Asp Gly Tyr Asp Val His Phe Pro Asn Val Ser
65   70   75   80

Arg Thr Leu His Asp Gly Tyr Leu Thr Ile Thr Ser Thr Arg Phe Ala
                85   90   95

Gln Ala Met Arg Gly Leu Met Lys Glu Asn Leu Leu Thr Asn Val Thr
            100   105   110

Val Ser Arg Val Ser Gly Gln Glu Val Thr Leu Ser Asp Gly Arg Arg
            115   120   125

Phe Thr Ala Gly Ala Val Ile Asp Gly Arg Gly Tyr Gln Pro Ser Pro
    130   135   140

His Leu Ser Ile Gly Tyr Gln Ala Phe Ile Gly Gln Glu Trp Gln Leu
145   150   155   160

Thr Ala Pro His Gly Leu Thr Arg Pro Ile Leu Met Asp Ala Arg Val
                165   170   175

Ala Gln Gly Asn Gly Tyr Arg Phe Val Tyr Thr Leu Pro Leu Ser Ala
            180   185   190

Asp Thr Leu Leu Ile Glu Asp Thr His Tyr Ile Asp Gly Pro Thr Leu
        195   200   205

Asp Ala Asp Ser Ala Arg Ala Arg Ile Ala Asp Tyr Ala Arg Gln Gln
    210   215   220

Gly Trp Gln Leu Ala Arg Leu Val Arg Glu Glu Gln Gly Ala Leu Pro
225   230   235   240

Ile Thr Leu Ser Gly Asp Pro Ala Ala Phe Trp His Gln Phe His His
                245   250   255

Gln Pro Val Ser Gly Leu Arg Ala Gly Leu Phe His Ala Thr Thr Gly
            260   265   270

Tyr Ser Leu Pro Leu Ala Val Arg Leu Ala Asp Arg Ile Ala Asn Ala
    275   280   285

Pro Gly Leu His Gln Gly Ala Leu Tyr Gln Leu Ile Ala Asp Phe Ala

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Ala Arg His Trp Gln Thr Gln Arg Phe Phe Arg Leu Leu Asn Arg Met
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                325             330                 335


Phe Tyr Gln Leu Asp Glu Gln Leu Ile Ala Arg Phe Tyr Ala Gly Gln
            340             345             350


Leu Arg Ser Ala Asp Arg Ala Arg Leu Leu Leu Gly Lys Pro Pro Val
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Arg Asp Lys Pro Gly Gly Arg Ala Tyr Val Tyr Glu Asp Arg Gly Phe
        35                  40                  45


Thr Phe Asp Ala Gly Pro Thr Val Ile Thr Asp Pro Ser Ala Ile Glu
    50                  55                  60


Glu Leu Phe Thr Leu Ala Gly Lys Arg Leu Lys Asp Tyr Val Glu Leu
65                  70                  75                  80


Met Pro Val Thr Pro Phe Tyr Arg Leu Cys Trp Glu Asp Gly Lys Val
                85                  90                  95


Phe Asp Tyr Ala Asn Asp Gln Ala Ala Leu Glu Ser Gln Ile Ala Ala
            100                 105                 110


Phe Asn Pro Asn Asp Val Ala Gly Tyr His Arg Phe Leu Asp Tyr Ser
            115                 120                 125


Arg Ala Val Phe Ala Glu Gly Tyr Leu Lys Leu Gly Ala Val Pro Phe
    130                 135                 140


Leu Ser Phe Arg Asp Met Leu Arg Ala Gly Pro Gln Leu Ala Arg Leu
145                 150                 155                 160


Gln Ala Trp Arg Ser Val Tyr Asp Lys Val Ser Ala Tyr Val Glu Asp
                165                 170                 175


Glu His Leu Arg Gln Ala Phe Ser Phe His Ser Leu Leu Val Gly Gly
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Asn Pro Phe Ser Thr Ser Ser Ile Tyr Thr Leu Ile His Ala Leu Glu
        195   200   205

Arg Glu Trp Gly Val Trp Phe Pro Arg Gly Gly Thr Gly Ala Leu Val
        210   215   220

Gln Gly Met Val Lys Leu Phe Gln Asp Leu Gly Gly Thr Leu Thr Leu
225   230   235   240

Asn Ala Gln Val Glu Arg Leu Glu Thr Val Asp Asn Gln Val Lys Ala
                245   250   255

Val His Leu Val Asn Gly Gln Arg Leu Glu Ala Ala Ala Val Ala Ser
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Asn Ala Asp Val Val Asn Thr Tyr Ala Arg Leu Leu Gly His His Pro
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        290   295   300

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                325   330   335

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His Ala Pro Cys Val Thr Asp Pro Ser Leu Ala Pro Pro Gly Cys Gly
        355   360   365

Ser Tyr Tyr Val Leu Ala Pro Val Pro His Leu Gly Asn Ala Pro Leu
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                405   410   415

Arg Met Phe Thr Pro Glu Asp Phe Arg Asp Thr Leu Asp Ala Trp Gln
                420   425   430

Gly Ser Ala Phe Ser Leu Glu Pro Ile Leu Thr Gln Ser Ala Trp Phe
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Arg Pro His Asn Arg Asp Ser Val Val Asp Asn Leu Tyr Leu Val Gly

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                      20   25   30

Arg Ser Ala Leu Met Leu Tyr Thr Trp Cys Arg Tyr Cys Asp Asp Val
          35   40   45

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Ile Asp Gly Gln Val Val Gly Phe Ala Ala Pro Thr Glu Gln Ser Asp
    50              55                  60

Thr Pro Glu Ala Arg Leu Gln Arg Leu Arg Lys Met Thr Arg Arg Ala
65              70                  75                      80

Tyr Asp Gly Glu Thr Met Gln Glu Pro Pro Phe Ala Ala Phe Gln Glu
                85              90                  95

Val Ala Leu Ala His Ala Ile Pro Pro Thr Gln Ala Phe Asp His Leu
            100             105                 110

Glu Gly Tyr Ala Met Asp Val Arg Asn Glu Arg Tyr Tyr Ser Leu Asp
        115             120                 125

Asp Thr Leu Arg Tyr Cys Tyr His Val Ala Gly Val Val Gly Leu Met
    130             135                 140

Met Ala Arg Val Met Gly Val Arg Asp Glu Ala Thr Leu Asp Arg Ala
145             150             155                 160

Cys Asp Leu Gly Ile Ala Phe Gln Leu Thr Asn Ile Ala Arg Asp Ile
            165             170                 175

Val Asp Asp Ala Gln Val Gly Arg Cys Tyr Leu Pro Gln Gln Trp Leu
            180             185                 190

Ala Glu Val Gly Leu Asn Glu Gln Thr Cys Thr Val Arg Ala Asn Arg
        195             200                 205

Pro Ala Leu Ala Arg Leu Ala Ala Arg Leu Val Thr Glu Ala Glu Pro
    210             215                 220

Tyr Tyr Gln Ser Ala Leu Ala Gly Leu Gly Asp Leu Pro Leu Arg Ser
225             230             235                 240

Ala Trp Ala Ile Ala Thr Ala His Gly Val Tyr Arg Glu Ile Gly Val
            245             250                 255

Lys Val Leu Met Ala Gly Glu Lys Ala Trp Asp Thr Arg Gln Gly Thr
            260             265                 270

Thr Arg Ala Glu Lys Leu Ala Leu Val Ile Ser Gly Ala Lys Gln Ala
        275             280                 285

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Gln Arg Pro Arg
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Met Glu Gly Val Ala Thr Phe Ala His Lys Tyr Ile Met His Gly Trp
                20                  25                  30


Gly Trp Gly Trp His His Ser His His Thr Pro Arg Lys Gly Ala Phe
            35                  40                  45


Glu Arg Asn Asp Leu Tyr Ala Val Val Phe Ala Leu Leu Ala Ile Ala
        50                  55                  60


Leu Ile Tyr Ala Gly Ser Glu Gly Tyr Trp Pro Leu Gln Trp Ile Gly
65                  70                  75                  80


Ala Gly Met Thr Gly Tyr Gly Val Ile Tyr Phe Ile Val His Asp Gly
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Leu Val His Gln Arg Trp Pro Phe Arg Tyr Val Pro Arg Arg Gly Tyr
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Leu Arg Arg Leu Tyr Met Ala His Arg Leu His His Ala Val Arg Gly
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Arg Glu Gly Cys Val Ser Phe Gly Phe Ile Tyr Ala Pro Pro Val Asp
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